<u>ABSTRACT</u>

A packer fluid is provided for use with a wellbore fluid in an annulus or casing bore, having an aqueous portion which contains additives for preventing corrosion, microbiological activity, salt and scale deposition, and an environmentally-acceptable capping fluid which resides at a top of the wellbore to act as freeze protection and as thermal insulation in a the frost penetration layer. The additives in the packer fluid are particularly selected to exist in the aqueous additive fluid and in the wellbore fluid and to be substantially immiscible with the capping fluid and thereby prevent significant migration of the additives into the capping fluid which would compromise its environmental acceptability.